

CLAIMS:

1. A band pass filter comprising: a first half-wave ( $\lambda/2$ ) resonator having a first open end on which an input terminal is formed and a second open end opposite to the first open end, a second half-wave ( $\lambda/2$ ) resonator having a third open end on which an output terminal is formed and a fourth open end opposite to the third open end, and an evanescent waveguide interposed between the second open end of the first resonator and the fourth open end of the second resonator, the first half-wave ( $\lambda/2$ ) resonator, the second half-wave ( $\lambda/2$ ) resonator, and the evanescent waveguide being a single unit.

2. The band pass filter as claimed in claim 1, wherein the first half-wave ( $\lambda/2$ ) resonator, the second half-wave ( $\lambda/2$ ) resonator, and the evanescent waveguide are made of a single dielectric unit

15 3. The band pass filter as claimed in claim 2, wherein an overall dimension of the band pass filter is a substantially rectangular prismatic shape.

20 4. The band pass filter as claimed in claim 1, wherein a passing band of the band pass filter is not less than 5 GHz.

5. A band pass filter comprising:

first and second dielectric blocks each of which has a top surface, a  
25 bottom surface, first and second side surfaces opposite to each other, and  
third and fourth side surfaces opposite to each other;  
a third dielectric block in contact with the first side surface of the

first dielectric block and the first side surface of the second dielectric block:

metal plates formed on the top surfaces, the bottom surfaces, the third side surfaces, and the fourth side surfaces of the first and second

a first electrode formed on the second side surface of the first dielectric block; and

a second electrode formed on the second side surface of the second dielectric block.

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6. The band pass filter as claimed in claim 5, wherein the first dielectric block and the second dielectric block have the same dimensions.

7. The band pass filter as claimed in claim 5, wherein the third  
15 dielectric block has a first side surface in contact with the first side surface  
of the first dielectric block, a second side surface in contact with the first  
side surface of the second dielectric block, a third side surface parallel to  
the third side surface of the first dielectric block, a fourth side surface  
parallel to the fourth side surface of the first dielectric block, a top surface  
20 parallel to the top surface of the first dielectric block, and a bottom surface  
parallel to the bottom surface of the first dielectric block on which a metal  
plate is formed.

8. The band pass filter as claimed in claim 7, wherein the bottom  
25 surfaces of the first to third dielectric blocks are coplanar.

9. The band pass filter as claimed in claim 8, wherein the top surfaces

of the first to third dielectric blocks are coplanar.

10. The band pass filter as claimed in claim 7, wherein members of at least one pair of surfaces among a first pair consisting of the top surfaces of the first and third dielectric blocks, a second pair consisting of the third surfaces of the first and third dielectric blocks, and a third pair consisting of the fourth surfaces of the first and third dielectric blocks fall in different planes.
- 10 11. The band pass filter as claimed in claim 5, wherein the first dielectric block and the metal plates formed on the top surface, bottom surface, second side surface, and third side surface thereof constitute a first half-wave ( $\lambda/2$ ) dielectric resonator, the second dielectric block and the metal plates formed on the top surface, bottom surface, second side surface, and third side surface thereof constitute a second half-wave ( $\lambda/2$ ) dielectric resonator, and the third dielectric block constitutes an evanescent waveguide.
- 20 12. A band pass filter comprising: a plurality of half-wave ( $\lambda/2$ ) dielectric resonators and at least one evanescent waveguide interposed between adjacent half-wave ( $\lambda/2$ ) dielectric resonators, the half-wave ( $\lambda/2$ ) dielectric resonators and the evanescent waveguide being made of a single dielectric unit.
- 25 13. The band pass filter as claimed in claim 12, wherein an overall dimension of the band pass filter is a substantially rectangular prismatic shape.

14. The band pass filter as claimed in claim 12, wherein at least one slit is formed in the dielectric block at a portion thereof acting as the evanescent waveguide.

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15. A band pass filter comprising: a dielectric block of substantially rectangular prismatic shape constituted of a first portion lying between a first cross-section of the dielectric block and a second cross-section of the dielectric block substantially parallel to first cross- section and second and third portions divided by the first portion and metal plates formed on the surfaces of the dielectric block, thereby enabling the first portion of the dielectric block and the metal plates formed thereon to act as an evanescent waveguide, the second portion of the dielectric block and the metal plates formed thereon to act as a first resonator, and the third portion of the dielectric block and the metal plates formed thereon to act as a second resonator, the metal plates being formed on, among the surfaces of the second and third portions of the dielectric block, each surface which is substantially perpendicular to the cross-sections.

20 16. The band pass filter as claimed in claim 15, wherein the metal plates further include a first exciting electrode formed on, among the surfaces of the second portion of the dielectric block, a surface which is substantially parallel to the cross-sections and a second exciting electrode formed on, among the surfaces of the third portion of the dielectric block, a surface which is substantially parallel to the cross-sections.

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